



Standard Test Method for Measuring Insertion Loss of Pneumatic Exhaust Silencers¹

This standard is issued under the fixed designation E1265; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the laboratory measurement of both the acoustical and mechanical performance of pneumatic exhaust silencers designed for quieting compressed gas (usually air) exhausts from orifices connected to pipe sizes up to $\frac{3}{4}$ in. NPT. This test method is not applicable for exhausts performing useful work, such as part conveying, ejection, or cleaning. This test method evaluates acoustical performance using A-weighted sound level measurements.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in Section 8.

2. Referenced Documents

2.1 ASTM Standards:²

C634 Terminology Relating to Building and Environmental Acoustics

2.2 ANSI Standards:³

S1.4 Specification for Sound Level Meters

S1.13 Method for the Measurement of Sound Pressure Levels

S1.31 Precision Method for the Determination of Sound Power Levels of Broad-Band Noise Sources in Reverberation Rooms

S1.33 Engineering Methods for the Determination of Sound Power Levels of Noise Sources in a Special Reverberation Room

B2.1 Taper Pipe Thread (NPT)—Standard Designation for Tapered Pipe Threads

2.3 Federal Standard:

Rules and Regulations—Hand and Portable Power Tools and Equipment⁴

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, see Terminology **C634**. Particular terms of interest are: *sound level* and *average sound pressure level*.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *flow ratio*—the ratio of gas flow with the pneumatic exhaust silencer installed relative to flow of the unrestricted pipe.

3.2.2 *flow resistance*—the reduction of fluid flow caused by various restrictions, surface roughness, devious paths, obstacles, etc. This term is sometimes referred to as “back pressure.”

3.2.3 *Discussion*—For this test method back pressure is a qualitative term, therefore, there is no need to measure.

3.2.4 *insertion loss of a pneumatic exhaust silencer (at a specific supply pressure)*—the difference in average A-weighted sound levels measured with and without the pneumatic exhaust silencer installed on an unrestricted or “open” pipe.

3.2.5 *Discussion* —Insertion loss, as defined in this test method, differs from the definition in Terminology **C634**. As stated in 1.1, this test method uses A-weighting rather than discrete frequency bands. It compares a set of sound pressure data measured in a reverberation room rather than determining absolute sound power levels. This test method is intended to assess the difference in sound regenerated at the pipe orifice and does not evaluate sound propagating along the pipe interior.

¹ This test method is under the jurisdiction of ASTM Committee E33 on Building and Environmental Acoustics and is the direct responsibility of Subcommittee E33.08 on Mechanical and Electrical System Noise.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ This United States Occupational Safety and Health Administration Regulation, *Federal Register*, Vol 36, Number 105, Part II, p. 10653, May 1971, is available from Superintendent of Documents, Government Printing Office, Washington, DC 20402–9371.